

area. Koelz measures 9 females from the Londa District as 199-209 mm.

The Indian Tawny Eagle : *Aquila rapax vindhiana* (Franklin).

This has been inadvertently omitted so far, though it is often seen during the cold weather when snipe-shooting. Powai, 24th Jan. 1942. Mulund 18th Jan. 1943. The beak is larger than in the pariah kite and shows more yellow at the gape. The rump is also paler and the tail rounder.

The Nilgiri Wood-pigeon : *Columba elphinstonii* (Sykes).

A single bird was seen at Matheran on 23rd April 1944. The black and white spots on the neck were prominent.

The Blue-breasted Quail : *Excalfactoria chinensis chinensis* (Linn.)

In Stray Feathers (Vol. x, p. 165) a specimen is recorded as obtained by Wenden at Vihar Lake, Salsette.

The Sanderling : (*Crocethia alba* (Pallas)).

There is a specimen in St. Xavier's College marked 'Gorai', Salsette, 16th November 1936—G. Palacios.

The Indian Shag : *Phalacrocorax fuscicollis* (Stephen).

A solitary bird was seen in the large mixed colony of *P. niger* and *Bulbulcus* at Borivli on 25th August. It is distinctly large than *niger*, with a white throat and brown-speckled wings.

33, PALI HILL, BANDRA,
BOMBAY.

SĀLIM ALI,
HUMAYUN ABDULALI

19.—NOTES ON INDIAN BIRDS—A CORRECTION.

E. H. N. Lowther in *J.B.N.H.S.*, vol. xliii, p. 389, in an article on Indian Hornbills, writes of and has excellent photographs of the Malabar Pied Hornbill.

This has, however, been referred to as *H. malabarica*. The key in the *Fauna* (vol. iv, p. 286) and the tails which are distinctly visible in the photographs show that the bird meant is *H. coronata*. Paradoxically, the trivial name of *H. malabarica* is the Large Indian Pied Hornbill.

This may perhaps merit an editorial correction in the Journal.

MESSRS. FAIZ & Co.,
75, ABDULREHMAN ST., BOMBAY, 3.
BOMBAY, 5th October, 1944.

HUMAYUN ABDULALI.

20.—ACCLIMATISATION OF MIRROR CARP IN THE NILGIRIS.

One aspect of inland fishery development in Madras is the introduction of improved varieties of exotic food fish. The following new kinds have been acclimatised and bred in the Presidency.

1. Trout (*Salmo iridens*) from England and New Zealand.
2. Common carp (*Cyprinus carpio*) from Europe.

3. Tench (*Tinca vulgaris*) from Europe.
4. Gourami (*Osphronemus goramy*) from Java and Mauritius.
5. Mirror carp (*Cyprinus carpio* var. *specularis*) from Prussia through Ceylon.

In this note a brief account of the Mirror Carp is given.

The Mirror Carp is a variety of the common European Carp. The difference between the two is in scaling. In the common carp, the body is uniformly covered with large scales of polygonal shape. The Mirror Carp has extraordinarily large scales of great reflective power which may cover the whole or part of the body.

The mouth of the Mirror Carp is relatively small and essentially suctional. The jaws are devoid of teeth; but the pharyngeal bones are provided with teeth for purpose of crushing. The fish is omnivorous. Its food consists of insects, small crustaceans and molluscs, and vegetable matter. The latter makes up a large part of its diet. It obtains its food by rooting about in the mud like a pig, making the water turbid. By so doing, and by destroying the natural aquatic vegetation, it sometimes makes the waters where it is abundant unsuitable for other fishes. It is said that it not only feeds on the young and eggs of game fishes, but also attacks wild fowl.

The Mirror Carp thrives well in higher altitudes. It can be acclimatised even to lower elevations of 2000 to 3000 feet, but gets stunted in growth. It prefers quiet, weed-grown waters, but can also live in rather swiftly flowing streams. If kept in small ponds the fish has to be fed on earthworms, bread, or rice, but if in large reservoirs or rivers, it does not require any artificial food.

The fish breeds prolifically, spawning taking place during the cold months. The eggs are deposited among vegetation. In the absence of weeds, the eggs fall into the mud, and die.

The Mirror Carp is said to grow to three feet in length, and 60 lbs. in weight. It is valued as an excellent food fish, but not as a sporting fish. It is tenacious of life and will live out of water a considerable time, and hence may easily be marketed.

The fish was first introduced into Ceylon from Prussia in 1914 by the Ceylon Fishing Club. They averaged about 6 inches in length when introduced and speedily grew in the Hatchery Ponds in Nuwara Eliya, but though kept there for some years did not breed. To encourage them to breed they were removed to Abbotsford Estate at a lower elevation and kept in an open pond, again with no success, though they attained 5 to 6 lbs. in weight. Finally they were returned to Nuwara Eliya and turned into a large pond in the Park, where, due to the presence of a plentiful supply of water lilies which provide breeding facilities, they bred and have continued to breed ever since. Mirror Carp were also successfully introduced into the Hatton District at an elevation of 4,200 ft. and have bred there. In Ceylon they have grown to a weight of from 30 to 40 pounds in the Nuwara Eliya Lake.¹

¹ These details were kindly furnished by Mr. Phillip Cowke, Secretary, Ceylon Fishing Club.

Owing to their large size, rapid growth, and prolific reproduction, coupled with their resistance to drought and ability to sustain life in the most barren ponds, Mirror Carp are a highly suitable food fish for culture in South Indian hill waters. In January 1939, fifty-five Mirror Carp fingerlings, ranging in size from 6 to 8 inches were successfully transported from Ceylon and planted in the Crescentic pond in the Government Botanical Gardens, Ootacamund (7,000 ft.). Though the Crescentic pond is small and only 3 ft. in depth, the fish thrived very well and bred in the beginning of 1942, after an interval of exactly three years. The adult fish measured 2 feet, thus showing a rate of growth of 6 inches per year. Nearly 1,000 fingerlings, measuring 3 to 6 inches in size were found in the pond in May 1942.

The fact that the fish had outgrown the Crescentic pond, necessitated the transfer of some of the adults and fingerlings in 1942 to a more suitable and larger pond in Sim's Park, Coonoor. In this pond also the fish bred, and thrived well showing a rate of growth of 4 to 6 inches in six months. Many fingerlings were stocked in the Ooty Lake in 1943. The fisheries of the lake are now protected and regulated by the issue of licences for angling only. The Ralliah Reservoir, which is the main water supply to the Coonoor town, was also stocked with fingerlings of this fish.

It has clearly been established that the Nilgiris suits the Mirror Carp. If lakes, ponds, and streams in the hilly regions of this Presidency are stocked with Mirror Carp, a new and good source of food fish can be made available to the population. It is, therefore, proposed to stock the Lovedale Lake (Nilgiris), Yercaud Reservoir (Shevaroy Hills), Kodaikanal Lake (Palni Hills) and other suitable hill waters with this fish. As a preliminary to this, the construction of a fish farm at Ooty for large scale culture of Mirror Carp is under the consideration of the Department. The ultimate aim is to place the fish in the markets of Ooty, Coonoor and other towns in the hills.

Experiments are being conducted to acclimatise Mirror Carp on the plains. In February 1943, fifty fingerlings, ranging in size from 5 to 13 inches, were successfully transported and stocked in a pond in the Thandipandal Fish Farm in the Kambakkam Forest area (Chingleput District), situated at an elevation of only 500 ft. The fish are thriving well, though the rate of growth is only 3 to 4 inches per year.

Fingerlings of Mirror Carp are now available with the Department for supply to those interested in their culture, at a cost of Rs. 10 per dozen.

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INDUSTRIES AND COMMERCE, Assistant Director of Fisheries
CHEPAUK, MADRAS, (Inland Development).
September 15, 1944.

References—

1. File on Mirror Carp Culture in the Office of the Director of Industries and Commerce, Madras.

2. File on Mirror Carp Culture in the Office of the Assistant Director of Fisheries, Inland, Central, Madras.
3. Report on the Fisheries of Madras for the years 1940-41 and 1941-42.
4. Administration Report of the Madras Fisheries Department for the years 1938-39 and 1939-40.

21.—NOTE ON THE FOOD OF TIGER SHARKS (*GALEO-CERDO SSP.*) OF THE MADRAS COASTS.

'All is grist to their mill': it seems their ravenous appetite incites them to snap at or swallow whole' all kinds of objects; they are said to bite dangling and protruding objects and seem to be easily attracted by white ones. This particular habit causes the attacks on human beings by these sharks. The presence of a stray shark in a pearl bed induces so much of fear in the minds of the pearl divers that they refuse to dive and sometimes the fishery itself comes to a sudden end. But these are all items which are not part of the diet of the Tiger Shark.

During the investigations on the shark fisheries of the Madras Presidency, a large number of specimens of Tiger Sharks (*Galeocerdo articus* and *G. rayneri*) were examined. The stomach contents included the following different kinds of food-fishes in the different areas: mackerel, seer, soles, silver-bellies, cat-fish, horse-mackerel, small sharks, skates and cuttle-fish on the Malabar and S. Kanara Coast; cat-fish, ribbon-fish and anchovies on the Vizagapatam Coast; and flying fish, hilsa, horse-mackerels, silver bellies, small sharks, small saw-fish in the Tanjore, Ramnad and Tinnevely Coasts.

Besides the above economically important food-fishes, turtles and sea-snakes have been common items in their diet. Sea-snakes have been observed in the stomach contents of Tiger Sharks captured on both the coasts.

It may not be out of place here to mention a few of the interesting objects which some of these sharks have swallowed. A non-gravid female *G. articus*, measuring 11 ft. in length, and caught off Tellicherry on 28th June 1943, had the head of a cow in its stomach. A 10 ft. male, caught off Pudimadakka in Vizagapatam Coast, on 12th January, 1944, had swallowed two biscuit tins. A male tiger shark, measuring 5 ft. in length and caught off Lawson's Bay on the same Coast on 11th January, 1944, had devoured a goat, and another male, 8 ft. long, had gulped in a bag containing 10 lbs. of raw rice!

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September 11th, 1944.

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